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RE: Draft Climate Action Team Report to the Governor and Legislature (8 December, '05)

Dear Dr. Lloyd:

On behalf of the DuPont Company, I am pleased to convey to you and your Climate Action Team the following comments relating to the Draft Climate Action Team Report to the Governor and the Legislature. DuPont is a global science company founded in 1802, and operating in more than 70 countries. DuPont offers a wide range of innovative products and services for markets including agriculture, nutrition, electronics, communications, safety and protection, home and construction, transportation and apparel. In the specific context of climate change, we have applied our science and materials technology to being part of the solution, and are active in solar energy, fuel cell technology, insulation, refrigeration and air conditioning, and other businesses that will play a crucial role in responding to climate change.

DuPont has a relatively modest operations presence in California. Our seven sites across the state range from agricultural research to electronics and communication technologies. They employ approximately 450 people and are spread among 6 counties. Our experience in the climate change arena, however, is considerable and sets the context for our comments.

CONTEXT OF DUPONT COMMENTS

Climate change is both an environmental and an energy issue. Climate change is a serious environmental risk that warrants prudent action, but responding to that risk necessarily involves finding ways to address energy needs without undermining economic vitality in a carbon constrained world. DuPont made the judgment in 1991 that emerging science of climate change warranted prudent action to reduce our company's emission profile. We publicly announced greenhouse gas emission reduction and energy consumption goals for our global operations for the decade of the '90s and re-upped those for the current decade, adding a goal to obtain 10% of our total energy from renewable resources. As noted in your Draft Report and reiterated in the Climate Team's December Workshop, we have accomplished much. By the end of 2003, we had exceeded our 65% GHG emissions reduction goal versus 1990 levels. We are currently considering a new GHG reduction goal for the decade from 2004 to 2015 (which we expect to finalize later this year).

It is important to note that our significant absolute reduction was largely the product of successfully controlling non-energy greenhouse gas emissions from our chemical manufacturing activity. For most of industry and certainly for economies as a whole – California's included – progress in mitigating future emissions must come from energy. DuPont has reduced its absolute energy consumption 6% from 1990 to 2004, despite increasing production volume approximately 35%. We, like many companies, had already invested heavily in cogeneration at our major manufacturing sites during the '80s. Recent US natural gas price increases that most of our economic competitors outside the US have not faced. These increases are indicative of the upward price pressures that will face most lower-carbon fuels in carbon-constrained economies.

GENERAL CONCLUSION

The Draft Report and its supporting documentation provide a strong foundation for action. However, its recommendations focus narrowly on extending the State's unilateral action to **mitigate emissions**. In contrast, the Draft Report fails to advance programs for **adapting to projected impacts** of even minor climate warming. At a time when the rest of the US and many of the growing economies of the World are resisting controls on GHG emissions, this strategic focus may have less impact on the State's climate risk than appears at first blush.

The primary thrust of the Report's recommendations would extend even further California's unilateral action to moderate emissions growth. The State's existing programs have already accomplished much in reducing its per capita emissions. New programs such as the recent PUC Solar Initiative (which DuPont has supported), will add further progress. However, these accomplishments and the additional reductions contemplated in the Draft Report are not directly related to California's risk from climate change. The latter is a function of both long-term atmospheric concentrations and global emission trends. Unilateral action by California has certainly stimulated more consideration of emission reduction outside the State, but the trends in emission growth across the US as a whole and in developing nations continue and will expose the State to increasing risk.

In contrast, this State may have a more direct impact on the risk it faces from climate change in the realm of adaptation. The Draft Report documents significant risk to the state even under low climate change scenarios and suggest that the existing infrastructure of the state will not be adequate to cope with those changes. Coping with those changes would have a more direct effect on the risk the State faces from global warming. Many of the responses could nest very well in the Governor's infrastructure initiative. Importantly, they could also send a very powerful signal that this state takes this issue seriously enough to take concrete steps to protect its citizens and its economy from foreseeable impacts.

These considerations argue that the emphasis on mitigation in this report, and indeed in the Governor's mandate, may be misplaced – that the return on investment for California could be greater in beginning its adaptation to probable impacts of climate change than in driving even more aggressive unilateral emission reduction action.

CONSIDERATIONS RELATING TO THE OVERALL DRAFT REPORT

The inter-agency approach taken by California is exemplary. The Governor and the Climate Action Team have clearly taken very seriously the risks of potential climate change. The State has also recognized that the scope of this challenge warrants attention in the highest levels of many of its agencies. The commitment of senior leadership from the key state agencies to the Climate Action Team is a testimony to this, as is the inter-agency process that has arisen to support the CAT. It is also clear and important that the State has made a successful effort to tap the relevant work already under way in its various agencies; and to capitalize on the scientific expertise at leading academic and research institutions around the state.

The emphasis on deepening scientific understanding of CA circumstances and building off that science is necessary. The effort to bridge between the current state of scientific understanding of global climate change and the highly evolved scientific understanding of California, its climate, water and other resources stands out as a particularly strong contribution of this CAT effort. While it is not yet possible to project the level of change with certainty, the CAT has assembled a strong scientific case suggesting unique and potentially very serious vulnerabilities in the State, particularly in the crucial realm of hydrologic systems.

The recognition of broad societal complicity in GHG emissions, and differing roles in moderating them is necessary. The Draft Report notes correctly the relevance of a very broad range of existing and potential programs in everything from agriculture to building design. Society cannot adequately respond to climate change solely on the backs of utilities or industry or autos. All of society's activities and decisions contribute to energy use and therefore have a role to play in responding to the climate challenge. The challenge, of course, will be to develop and stage actions tailored to those sectors in a way that maintains overall economic vitality.

"Leakage" matters -- there is insufficient consideration of economic implications of more aggressive unilateral mitigation mandates. The Draft Report notes in a number of places the challenge of controlling leakage – the potential for emissions to migrate to other, less constrained, economies rather than being truly reduced. Because of the global character of greenhouse gas concentrations, this concern must be more explicitly dealt with if the State is to be assured that its efforts are delivering real returns. While equilibrium models may suggest overall economic gains from climate actions, the challenge is that the State's economy is not self-contained – not in equilibrium.

More and more segments of the economy – from agriculture to electronics --are becoming "commoditized" with producers around the globe competing with one another for market share. Particularly for these industries, the issue is one of further disadvantaging California producers that are already challenged by cost advantages in labor and capital. Choices have to be made about what facilities can afford to keep going as competition

becomes cutthroat and market share goes to the lowest cost producer. Incremental cost increase such as recent natural gas prices or those that may follow more aggressive climate mandates can become the straw that breaks the camels back. It is not clear that this dimension of the issue is adequately dealt with by the economic analysis.

While it may be that many of the economic sectors can absorb additional costs with little negative (and some positive) impact, the Report should devote more attention to the differential impacts upon the State's strategic industries. The Netherlands at one point (prior to the EU-wide scheme) was beginning a program that recognized industries that were globally vulnerable and subjected them to a different program than those industries that were more self-contained. California may benefit from evaluating the merits of such an approach.

Energy supply must be part of the answer. As we contemplate carbon-constrained futures, it is essential to realize that the transition from today to that future will necessarily put much demand pressure on lower carbon fuels, including those such as natural gas that, while fossil in origin, are preferable in many respects that alternatives. In that context, viable resource areas should be reassessed, including those in and off California. The State is highly dependent on natural gas, and future programs will increase that dependence. Production of natural gas and sighting of LNG terminals will be evaluated as the state attempts to reconcile the future demands for cleaner fuels and the fact that few will be there to replace natural gas in the medium term. Efficiency improvements and other actions alone will not eliminate that need for lower carbon energy resources. The current supply/demand imbalance and the resulting excessive gas price is a harbinger of future conditions with carbon constraints if the supply side is not addressed.

REPORT RECOMMENDATIONS

Emissions reporting should be encouraged rather than required; and considered independently of cap & trade. DuPont recognizes value in emissions reporting. We began our annual public reporting on our emissions of each of the major greenhouse gases in 1992. Our view is that disciplined reporting can inform operations of their individual emissions profile, and enable them to identify opportunities for reducing that profile. It is important to realize that an emissions reporting process can have such value whether or not it is associated with any specific mandatory reduction program, be it cap & trade or some other approach.

There are many issues that must be addressed in emissions reporting, however. First and foremost in the current context is that, while we see value in emissions reporting, we oppose mandatory reporting programs at the state level. The accuracy and level of verification of registry systems that are used for emissions credits need to be balanced versus the cost of implementation. Reporting systems that are not intended as the basis for possible future crediting or emission trading should be less demanding, requiring the minimum level of effort for a defined purpose. Even within these guidelines, however, there are significant variations that can be taken. Our experience in facing multiple reporting systems globally tells us there would be significant burden to meeting numerous State-level programs, each applying different standards or approaches. This would particularly be the case where efforts were made to take cognizance of entity-wide emissions transcending multiple jurisdictions.

Provision for "credit for early action" is vitally important. The global attention to climate change has sensitized industries around the globe to the possibility (DuPont would argue "probability") of emission reduction mandates in our future. In this context, voluntary action to reduce emissions (to "take the low-hanging fruit") is increasingly being weighed against the possibility that 1) that "fruit" may have value in a future emission trading regime, and 2) future regulatory mandates may force additional reductions irrespective of past reduction accomplishments. Regardless of the type and manner of California's program, the state should do whatever it can to encourage companies and other entities to "do the right thing" and begin prudent action to reduce emissions. Credit for early action will be important in creating that environment. It must be noted, however, that California cannot insulate early actors from potential implications of future Federal actions.

CAP & TRADE

Emissions trading is an important tool in the long term challenge of climate change. DuPont believes that the responding to the long-term challenge of climate change will ultimately require economic effort far beyond the very modest beginnings currently contemplated in the Kyoto Protocol or even the Governor's mandates. Means of facilitating capital movement to the most cost-effective opportunities for emission mitigation will be essential to any long-term climate change strategy. Market mechanisms such as emissions trading will play a crucial role in facilitating that cost-effective use of limited capital. The Draft Report provides a good overview of rationale for and possible dimensions of potential trading schemes, and particularly the tradeoffs associated with various

options for framing such a scheme. The state should continue to study these, particularly focusing on those schemes already underway around the globe, including the Chicago Climate Exchange voluntary trading scheme in the US, the EU Emissions Trading Scheme which just got underway in 2005, the Kyoto Protocol emissions trading mechanisms, those of other countries such as Australia, and the Regional Greenhouse Gas Initiative being debated within the Northeastern US. These are all experiments and California should be well informed about their strengths and weaknesses. Emissions trading should therefore be on the radar screen of California as a tool that will likely have a place here over the longer term, particularly as part of a larger national or international program.

Embarking on a unilateral, state-based cap & trade initiative is not appropriate. There are two primary considerations leading DuPont to this conclusion. First, while trading holds promise of lowering the overall economic burden of achieving a given environmental target, the setting of a cap and related challenges of emission rights allocation promises constraints on those industries that are highly competitive – from agriculture to electronics. Such a State mandate carries with it the potential for economic dislocation if competing states are not similarly engaged.

Second, it is highly probable that any California program would be subordinated to a national emissions trading program, and its mechanisms and structure amended to conform to the latter. While such a Federal program is currently encountering strong resistance, it is also seen by many as a tool that will find its way into the picture. This would create a situation similar to that confronting the United Kingdom, when it expended major political and economic resources to fashion an emissions trading scheme only to find it subordinated to the newly created EU scheme just a couple of years after its enactment – a scheme that differed in many critical elements.

Aspects of emissions trading that should be considered in a future US-wide system. While it is not appropriate for the State to embark upon an aggressive unilateral system at this time, DuPont does believe such market programs are likely to have a place in the long term global response by the US to climate change. In planning for that longer-term possibility, DuPont believes the following should be kept in mind by regulators, particularly as they observe the successes or problems of experiments getting under way with such schemes:

- Ensure that CO2 eq. policies for each sector of the economy (manufacturing, transportation and residential-commercial) effectively take account of differing elasticities and price tolerances among sectors; and also recognize and address potential sectoral responses and their impact on energy availability and price.
- Recognize that properly balance programs may require efficiency standards or the like in certain cases, rather than across-the-board reliance upon cap & trade.
- Include a credit (not just neutral) for feedstocks derived from atmospheric CO2 that become sequestered as products.
- Include all significant greenhouse gases.
- Move early to implement credit for early action, to ensure that the long process of decision making on such programs does not create a disincentive for voluntary action.

ADDITIONAL MITIGATION MEASURES

The inventory of mitigation measures featured in the Draft report – both current and proposed – is impressive and provides a good overview of the range of measures relevant to a systematic emission mitigation response. It is particularly satisfying to see recognition of the possible contributions from both reduction and sequestration of emissions. These should continue to be evaluated with the aim of developing an overall long-term strategy for the State. That strategy should not ignore the range of mitigation measures, but rather should assess both the potential utility of the measures and the context and timing of their application. Incentive measures in areas where the State can be anticipated to develop competitive advantage – the solar initiative for example – may warrant early action. In contrast some measures that may significantly ramp-up competition for energy or energy prices should be more fully evaluated against their economic implications, particularly for competitive industries, and staged for implementation in a way that would not disadvantage the State economically.

As suggested by our “General Conclusion” however, DuPont believes the CAT should seriously consider a shift in emphasis to focus less on additional mitigation measures and more on embarking the state on the challenge of adapting its resources and infrastructure to probably future impacts. This is all the more important as infrastructure decisions that should be taking primacy now for California, may well have impacts upon or be impacted by decisions on some of these additional mitigation strategies. For example, those relating to

agricultural or forest sequestration may well depend upon significant adaptation decisions to assure long term viability. Similarly, the demands for human adaptation to potential increases in extreme heat events may well place more of a strain on utilities, which should be factored into any evaluation of the electricity measures, and will likely demand more efficient and readily available refrigeration and air conditioning systems. These interrelationships should be more fully explored as both the mitigation and adaptation measures are considered. So, too, should the enter-relationships between measures contemplated by California and those under way or being considered outside the State. A case in point is the arena of the "Hydrofluorocarbon Reduction Strategies" contained in the report. DuPont has had a leadership role in this since it catalyzed constructive industry engagement with the ozone depletion issue in the 1980's. Attached for your information is an **Annex** containing an evaluation of this section with particular attention to the interrelationship between the proposals in the report and the international conventions and related initiatives involving these chemicals.

As the State evaluates further the various mitigation measures contemplated, DuPont recommends that the following general principles and concerns be kept in mind, in addition to the general concerns and cautions discussed above:

Any mandates for limits or reductions in greenhouse gases should

- be framed in terms of "net GHG emissions" rather than using surrogates such as energy consumption
- ensure that changes driven are real, and
- be placed on practical schedules recognizing capital cycles so that major disruptions to economies and standards of living are avoided.

Energy-related policies should be responsive to supply/demand and price pressures, recognizing fuels vital to energy-intensive manufacturing including:

- Development and use of alternative non-fossil energy technologies
- Enhanced conservation measures by all sectors of the economy
- Enhanced, environmentally sound production/transport of lower GHG fuels, esp. natural gas
- Moderate the demand for natural gas through conservation, efficiency improvements, and fuel diversity
 - supply/demand must be balanced for the lower carbon fuels, natural gas especially, because cap and trade or other carbon-constraints would encourage more use of these fuels
- Fossil and non-fossil derived feedstocks should continue to be exempt from national greenhouse gas inventories and from any policy that would add a carbon price to their cost
- Transparency in energy prices with respect to added cost for GHG emission initiatives versus other efficiency investments

Thank you for the opportunity to offer these comments and perspectives. DuPont would be happy to elaborate on these points and engage further with your efforts to fashion California's response to this significant challenge. Please feel free to contact me should you have any questions or wish any follow-up.

Sincerely,

Thomas R. Jacob
Government Affairs Manager, Western Region
(sent by e-mail)

Attachment

ANNEX

DuPont Comment on "Hydrofluorocarbon Reduction Strategies"

Hydrofluorocarbons (HFCs) have been chosen for the applications in which they are used due to the value they contribute to the products in which they are used. The value derives from desirable properties that contribute to the efficiency, economy, performance, reliability and safety of these products. Significant among the properties is the safety characteristics of the HFCs including low toxicity and, in most cases, non-flammability. In the case of refrigerants, all of the commercially available HFCs or HFC blends are non-flammable under normal operating conditions.

DuPont fully supports actions to cost effectively minimize the climate impact of HFCs and the products in which they are used. In particular, DuPont helped initiate and supports Responsible Use Principles for HFCs (see <http://www.arap.org/responsible.html> for a listing of those principles) and also helped initiate and is a founding member of the Improved Mobile Air Conditioning (I-MAC) program (see www.sae.org/altrefrigerant/techcenter/IMAC.ppt for information on I-MAC). We have also reduced emissions of HFCs at our facilities, particularly HFC-23 that is produced as an unintended by-product of HCFC-22 production. The HFC-23 emission reductions were a major contributor to the corporate greenhouse gas emissions reductions described earlier. We continue to work with our customers and other stakeholders to reduce the environmental impact of HFC containing products.

The "Hydrofluorocarbon Reduction Strategies" section focuses on "measures to reduce HFC emissions from vehicular and commercial refrigeration systems." These applications are among the largest users of HFCs. Although we are supportive of activities that implement Responsible Use Principles for HFCs in these applications, we believe that some of the possible measures identified by ARB staff do not adequately take into account the advantages provided by HFCs. We address each of the five possible measures identified by ARB staff below.

Measure: "1. Ban the retail sale of hydrofluorocarbon (HFC) in small (mostly 12-oz.) cans. This would end the loss of can "heels" (small amounts of HFCs remaining in the can after service is complete) and prevent do-it-yourself refilling of vehicular air conditioning systems."

Comment: The objective of this measure is, or should be, that stated in Measure 5: Enforce the federal ban on releasing HFCs. Rather than banning a particular type of container, the most effective method of achieving this objective is to require that refrigerants be sold only to certified technicians with access to refrigerant recovery equipment. This measure should be eliminated and a requirement that refrigerants be sold only to certified technicians should be included in measures to enforce the federal ban on intentional venting of HFC refrigerants.

Measure: "2. Require that only low-GWP refrigerants be used in new vehicular systems. For vehicles subject to the ARB motor vehicle climate change emission reduction regulations, this requirement would take effect in 2017 because the adopted regulations already specify standards and compliance options through 2016. For medium- and heavy-duty vehicles not subject to the AB 1493 regulation, the requirement would take effect in the 2010 timeframe."

Comment: This measure is refrigerant prescriptive and does not account for the life cycle advantages (system efficiency) of HFC systems nor does it account for the safety and cost effectiveness of HFC systems. These HFC advantages were recognized in the Final Regulation Order implementing AB 1493. That Order allowed equipment producers to choose the most cost-effective option for meeting performance standards. The form of the Final Regulation Order implementing AB 1493 should be maintained and Measure 2 should be eliminated.

Measure: "3. Adopt specifications for new commercial refrigeration. Limit the global warming potential of refrigerants used in refrigerators in retail food stores, restaurants, and refrigerated transport vehicles (trucks and railcars) and/or require that centralized systems with large refrigerant charges and long distribution lines be avoided in favor of systems that use much less refrigerant and lack long distribution lines."

Comment: As in the case of Measure 2, Measure 3 is refrigerant and equipment prescriptive and ignores the system efficiency, safety and cost effectiveness of HFC systems. Commercial refrigeration systems use large amounts of energy and the carbon dioxide released in the generation of the power to run these systems can contribute more to climate change than that due to emissions of the HFC refrigerant. Measure 3 should be replaced with a measure that sets a performance standard that includes the greenhouse gas contribution of both the refrigerant emissions and the energy use of the systems. That measure should take into account safety and cost effectiveness as well.

Measure: "4. Add refrigerant leak-tightness to the "pass" criteria for vehicular Inspection and Maintenance programs (all vehicles) and adopt an "inspect and repair" measure for commercial systems. Require that systems either be leak-free at smog-check or be empty and inoperable."

Comment: The problem with Measure 4 is the definition of "leak-free." The California EPA and ARB staff should work with vehicle and equipment manufacturers to define a reasonable "leak-tight" standard for each equipment type and require that systems pass this standard during servicing and inspection.

Measure "5. Enforce the federal ban on releasing HFCs. This measure would focus on reducing emissions during the servicing and dismantling of vehicular air conditioners and commercial refrigeration systems."

Comment: DuPont fully supports enforcement of the federal ban on the intentional venting of HFC refrigerants as contained in the Clean Air Act Amendments of 1990. We believe that the U.S. EPA has full authority to conduct this enforcement and, therefore, there is no need for action by the California EPA.

